



MONTHLY OPERATIONS REPORT

MOR#078

Reporting period from 16-May-2020 to 15-Jun-2020

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1. Summary

In this reporting period, the majority of the synthesis products were nearly complete. Two missing transfer frame files and seven automatic recoveries were recorded with visible impact on the end products. The amount of decompression and geometric errors remain stable over time.

No major anomalies were recorded in the radiometric and geometric quality assessment.

9 new users registered, and the active users nearly downloaded 8 TB of data in this reporting period

Tests were executed on a new cloud masking algorithm and atmospheric correction module in development environment in preparation for 'Collection 2' of the data.

Furthermore, preparations are being done to announce the new experimental phase of PROBA-V.

2. System Infrastructure

Category	% Up Time	% Down Time
Switches	100.0	0.0
Database Servers	100.0	0.0
Mid Term File Servers	100.0	0.0
Short Term File Servers	100.0	0.0
Master Servers	100.0	0.0
Worker Nodes	100.0	0.0
PDF	100.0	0.0

Table 1: System Infrastructure availability for this reporting period

3. Image Processing Services

3.1. Ingested and archived products

Product Type	Total	Received	Missing data, ingested by VITO	Archived
METEO	248	248	0	248
TFF	310	308	2 ^(*)	308

Table 2: Ingested and archived products for this reporting period

(*) Problems with TFF 24415: No data transferred. Network outage in Inuvik for TFF 24676

3.2. Generated and archived products

Product Type	Total	Processed	Error	Archived
PROBAV_L1A - Calibration	256	256	0	256
PROBAV_L1A - Nominal	2622	2620	2 ^(*)	2622
PROBAV_L1C	2620	2620	0	2620
PROBAV_L2A_100M	937	937	0	937
PROBAV_L2A_300M	2620	2620	0	2620
PROBAV_L2A_1KM	2620	2620	0	2620
PROBAV_L3_S1_TOA_100M	31	31	0	31
PROBAV_L3_S1_TOC_100M	31	31	0	31
PROBAV_L3_S1_TOC_NDVI_100M	31	31	0	31
PROBAV_L3_S5_TOA_100M	6	6	0	6
PROBAV_L3_S5_TOC_100M	6	6	0	6
PROBAV_L3_S5_TOC_NDVI_100M	6	6	0	6
PROBAV_L3_S1_TOA_300M	31	31	0	31
PROBAV_L3_S1_TOC_300M	31	31	0	31
PROBAV_L3_S10_TOC_300M	3	3	0	3
PROBAV_L3_S10_TOC_NDVI_300M	3	3	0	3
PROBAV_L3_S1_TOA_1KM	31	31	0	31
PROBAV_L3_S1_TOC_1KM	31	31	0	31
PROBAV_L3_S10_TOC_1KM	3	3	0	3
PROBAV_L3_S10_TOC_NDVI_1KM	3	3	0	3

Table 3: Generated and archived products for this reporting period

(*) 2 * L1A error due geometric error



3.3. Backup and archiving service

Product type	Total Files	Total File Size (GB)
TFF	300	790.22
L1A	2796	1394.43
Database transaction logs	770	80.23
Database incremental back-up	44	17.38
Database full back-up	12	728.32

Table 4: Back-up data volumes for this reporting period

Product type	Total Files	Total File Size (GB)
PROBAV_TRANSFERFRAMES	257	734.91
PROBAV_L1A	2422	1294.79
PROBAV_L1C	2201	2535.57
PROBAV_L2A_100M	1207	1009.13
PROBAV_L2A_300M	3347	526.81
PROBAV_L2A_1KM	3352	71.85
PROBAV_L3_S1_TOA_100M	40	1092.81
PROBAV_L3_S1_TOC_100M	40	1120.96
PROBAV_L3_S1_TOC_NDVI_100M	40	127.75
PROBAV_L3_S5_TOA_100M	8	819.47
PROBAV_L3_S5_TOC_100M	8	842.37
PROBAV_L3_S5_TOC_NDVI_100M	8	91.98
PROBAV_L3_S1_TOA_300M	40	479.37
PROBAV_L3_S1_TOC_300M	40	490.65
PROBAV_L3_S10_TOC_300M	3	63.62
PROBAV_L3_S10_TOC_NDVI_300M	3	5.38
PROBAV_L3_S1_TOA_1KM	40	66.41
PROBAV_L3_S1_TOC_1KM	40	67.59
PROBAV_L3_S10_TOC_1KM	3	8.69
PROBAV_L3_S10_TOC_NDVI_1KM	3	0.68
ICP_GEOMETRIC_CENTRE	0	0
ICP_GEOMETRIC_LEFT	0	0
ICP_GEOMETRIC_RIGHT	0	0
ICP_RADIOMETRIC_CENTRE	1	0.04
ICP_RADIOMETRIC_LEFT	1	0.04
ICP_RADIOMETRIC_RIGHT	1	0.04
METEO_ECMWF	208	0.26
METEO_METEOSERVICES	208	1.11
POLARMOTION	1	0.00

Table 5: Archived data volumes for this reporting period

3.4. Dissemination service

Product type	Added to catalogue	Ordered	Delivered
PROBAV_L1C	2615	4	143
PROBAV_L2A_100M	908	0	6
PROBAV_L2A_300M	2621	0	19
PROBAV_L2A_1KM	2621	0	2
PROBAV_L3_S1_TOA_100M	31	4602	4287
PROBAV_L3_S1_TOC_100M	31	1110	797
PROBAV_L3_S1_TOC_NDVI_100M	31	0	4
PROBAV_L3_S5_TOA_100M	6	0	0
PROBAV_L3_S5_TOC_100M	6	408	407
PROBAV_L3_S5_TOC_NDVI_100M	6	155	186
PROBAV_L3_S1_TOA_300M	31	62	69
PROBAV_L3_S1_TOC_300M	31	63	153
PROBAV_L3_S10_TOC_300M	3	9	9
PROBAV_L3_S10_TOC_NDVI_300M	3	4	977
PROBAV_L3_S1_TOA_1KM	31	63	66
PROBAV_L3_S1_TOC_1KM	31	63	105
PROBAV_L3_S10_TOC_1KM	3	5	12
PROBAV_L3_S10_TOC_NDVI_1KM	3	300	555

Table 6: Ordered and delivered products for this reporting period



3.5. End-user activity

9 new user(s) were registered in this reporting period.

The total number of users registered for PROBA-V data and that have ordered data is **1812** with **121** different nationalities representing **1316** different companies/universities.

Product type	Africa	Asia	Europe	N- America	Oceania	S- America
PROBAV_L1C	0	161.23	9.93	0	0	0
PROBAV_L2A_100M	0	1.52	5.20	0	0	0
PROBAV_L2A_300M	0	0	4.59	0	0	0
PROBAV_L2A_1KM	0	0	0.08	0	0	0
PROBAV_L3_S1_TOA_100M	0	414.18	1279.93	0	0	0.00
PROBAV_L3_S1_TOC_100M	0	3.30	2905.03	725.57	0	0.00
PROBAV_L3_S1_TOC_NDVI_100M	0	0	1.68	0	0	0
PROBAV_L3_S5_TOA_100M	0	0	0	0	0	0
PROBAV_L3_S5_TOC_100M	12.70	0	1.88	0	0	0
PROBAV_L3_S5_TOC_NDVI_100M	5.47	0	0.20	0	0	2.63
PROBAV_L3_S1_TOA_300M	0	0	654.11	0	0	0
PROBAV_L3_S1_TOC_300M	0	0	732.21	329.78	0	0
PROBAV_L3_S10_TOC_300M	0.05	21.46	124.30	0	0	0
PROBAV_L3_S10_TOC_NDVI_300M	2.56	0.39	41.17	0	0	0.04
PROBAV_L3_S1_TOA_1KM	0	0	96.91	0.04	0	0
PROBAV_L3_S1_TOC_1KM	0	0	131.67	0	0	0
PROBAV_L3_S10_TOC_1KM	0	0	8.69	17.64	0	0
PROBAV_L3_S10_TOC_NDVI_1KM	0.69	1.56	9.51	0	0	0.01

Table 7: Data download (GB) in total per Origin of the User for the reporting period



Product Type	Global
L1C	171.15
PROBAV_L2A_100M	6.72
PROBAV_L2A_300M	4.59
PROBAV_L2A_1KM	0.08
PROBAV_L3_S1_TOA_100M	1694.11
PROBAV_L3_S1_TOC_100M	3633.90
PROBAV_L3_S1_TOC_NDVI_100M	1.68
PROBAV_L3_S5_TOA_100M	0
PROBAV_L3_S5_TOC_100M	14.58
PROBAV_L3_S5_TOC_NDVI_100M	8.30
PROBAV_L3_S1_TOA_300M	654.11
PROBAV_L3_S1_TOC_300M	1061.99
PROBAV_L3_S10_TOC_300M	145.81
PROBAV_L3_S10_TOC_NDVI_300M	44.16
PROBAV_L3_S1_TOA_1KM	96.95
PROBAV_L3_S1_TOC_1KM	131.67
PROBAV_L3_S10_TOC_1KM	26.33
PROBAV_L3_S10_TOC_NDVI_1KM	11.77

Table 8: Data download (GB) in total for the reporting period

Company	# Downloads
KIGAM	4196
JOINT RESEARCH CENTRE	743
NSMC	457
FST	453
VUB	273
VITO	265
CIRAD	239
-	197
ESA	158
DESCARTES UNDERWRITING	141

Table 9: Top 10 user companies for the reporting period

Country	# Users
CHINA	184
BELGIUM	162
FRANCE	86
INDIA	84
BRAZIL	81
UNITED STATES	80
ITALY	76
NETHERLANDS	62
UNITED KINGDOM	60
GERMANY	57

Table 10: Top 10 countries with most registered users

List of issues raised by users:

login on X2Go
jenkinsslave3 had stale nfs handle
muisklikken in VM niet geregistreerd
PDF: N.A. - jiwon won - 2020/6/9
Re: [VITO RS] Re: Benchmark
epod-master1 and epod-master2 not reachable anymore
Abort application_1590053516628_27572
Abort application_1590053516628_25781
executor fail
Abort application_1590053516628_12561
Airflow mist een package
container hang

4. Image Calibration services

4.1. Radiometric Calibration

Calibration request type	Total	Processed	Not received	Error
CLOUDS	17	17	0	0
DARK CURRENT	21	21	0	0
MOON	2	2	0	0
RAYLEIGH	51	49	1	1
SNOW	0	0	0	0
SUN_GLINT	0	0	0	0

Table 11: Calibration Image requests for this reporting period

Calibration image type	Total	Valid	Invalid
PROBA_V_L1A_CALIBRATION	2	0	0
PROBA-V_L1B_CALIBRATION	254	229	25
PROBA-V_L1B_INTERSECTION	768	417	351
PROBA-V_L1B_OVERLAPREGION	0	0	0

Table 12: Processed calibration images for this reporting period

Long-term monthly Libya-4 mean plots for different cameras are given in Figure 1 and Figure 2 and Figure 3. Deep convective clouds interband calibration results are given in Figure 4.

Observed trends are similar as reported in previous months:

- a relatively strong positive trend is observed in the Libya-4 results of all strips of the RIGHT camera since roughly a year.
- The RED strips of all cameras show a positive trend, causing a clear trend in the BLUE DCC interband calibration results which are expressed relatively to the RED band.

At the moment this increasing trend is not taking into account in the ICP files. It is being investigated how to correct for it in the next reprocessing .

3 new bad pixels were identified : Center SWIR3 Pixel ID 141 (0-based), LEFT SWIR1 PixelID 84 (0-based), LEFT SWIR3 PixelID 890 (0-based). The brings the total number of bad pixels in Center SWIR3 to 24.

Radiometric ICP file

The BLUE LEFT/CENTER absolute calibration coefficients will be updated following a linear degradation model. Furthermore the dark currents will be updated and three bad pixel will be added

Center SWIR3 Pixel ID 141 (0-based), LEFT SWIR1 PixelD 84 (0-based), LEFT SWIR3 PixelD 890 (0-based).

The current ICP files are:

- PROBAV_ICP_RADIOMETRIC#LEFT_20200601_V01
- PROBAV_ICP_RADIOMETRIC#CENTER_20200601_V01
- PROBAV_ICP_RADIOMETRIC#RIGHT_20200601_V01

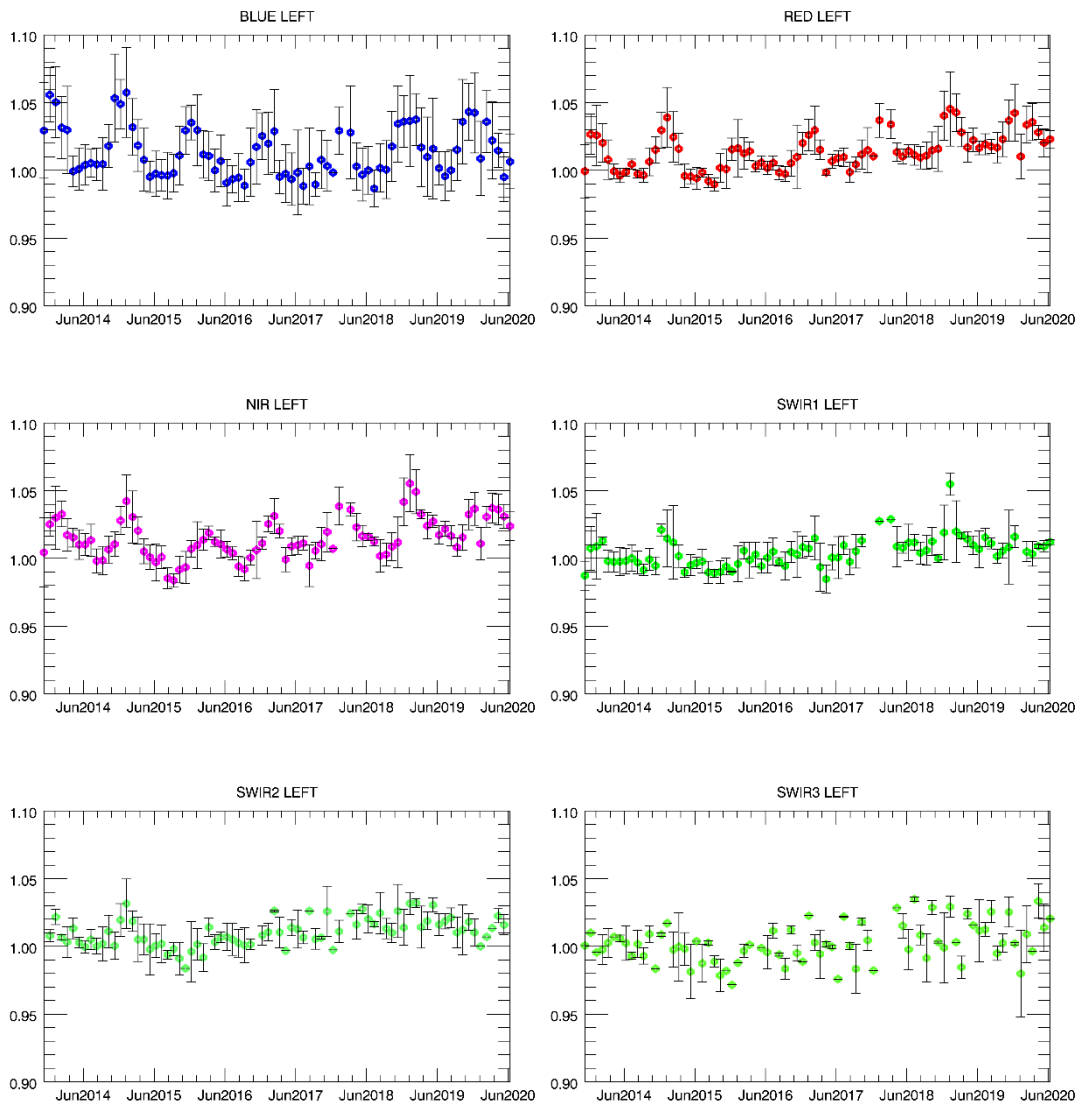


Figure 1. Libya-4 desert calibration results: LEFT monthly averaged results (collection 1)

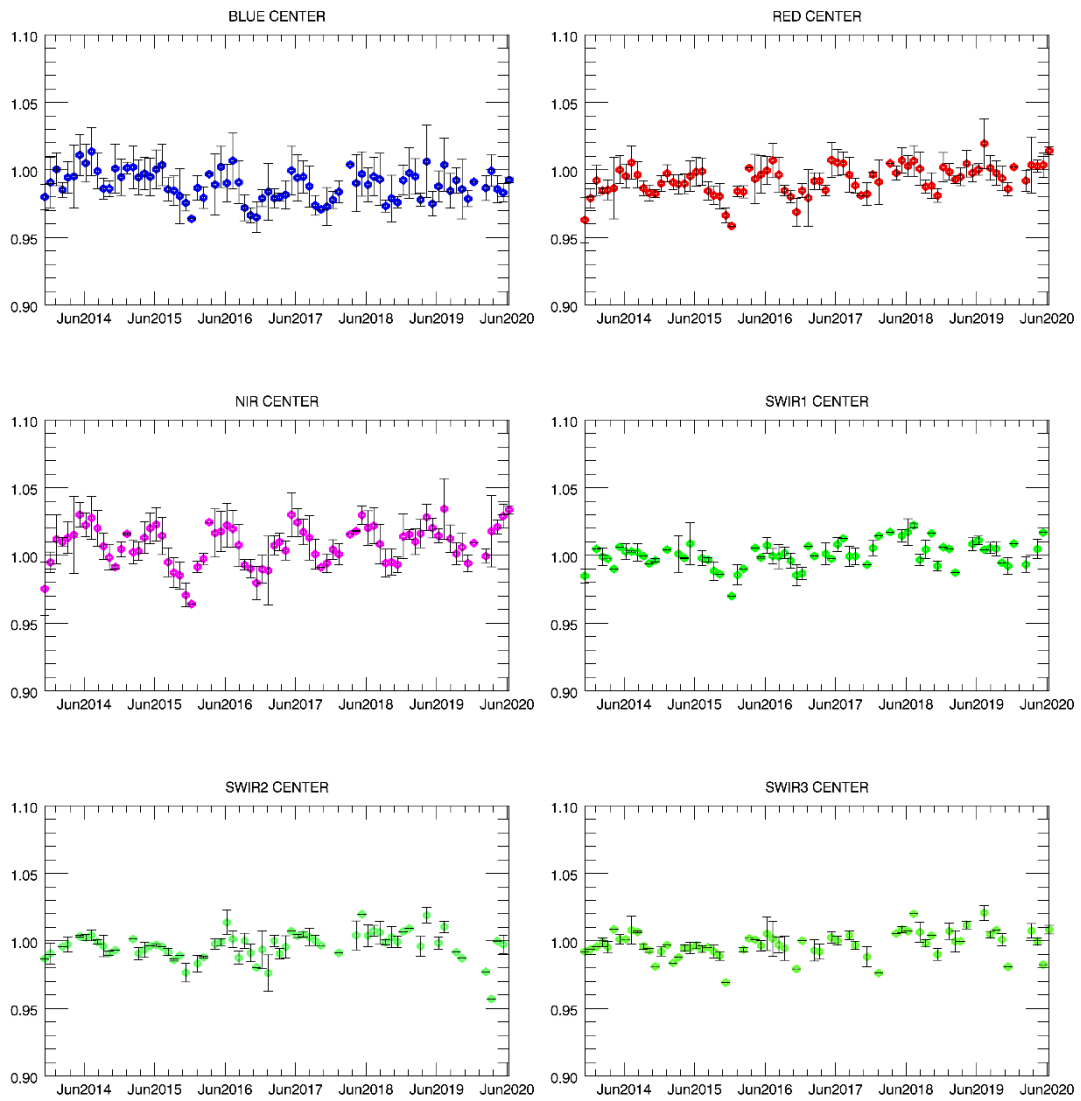


Figure 2. Libya-4 desert calibration results: CENTER monthly averaged results (collection 1)

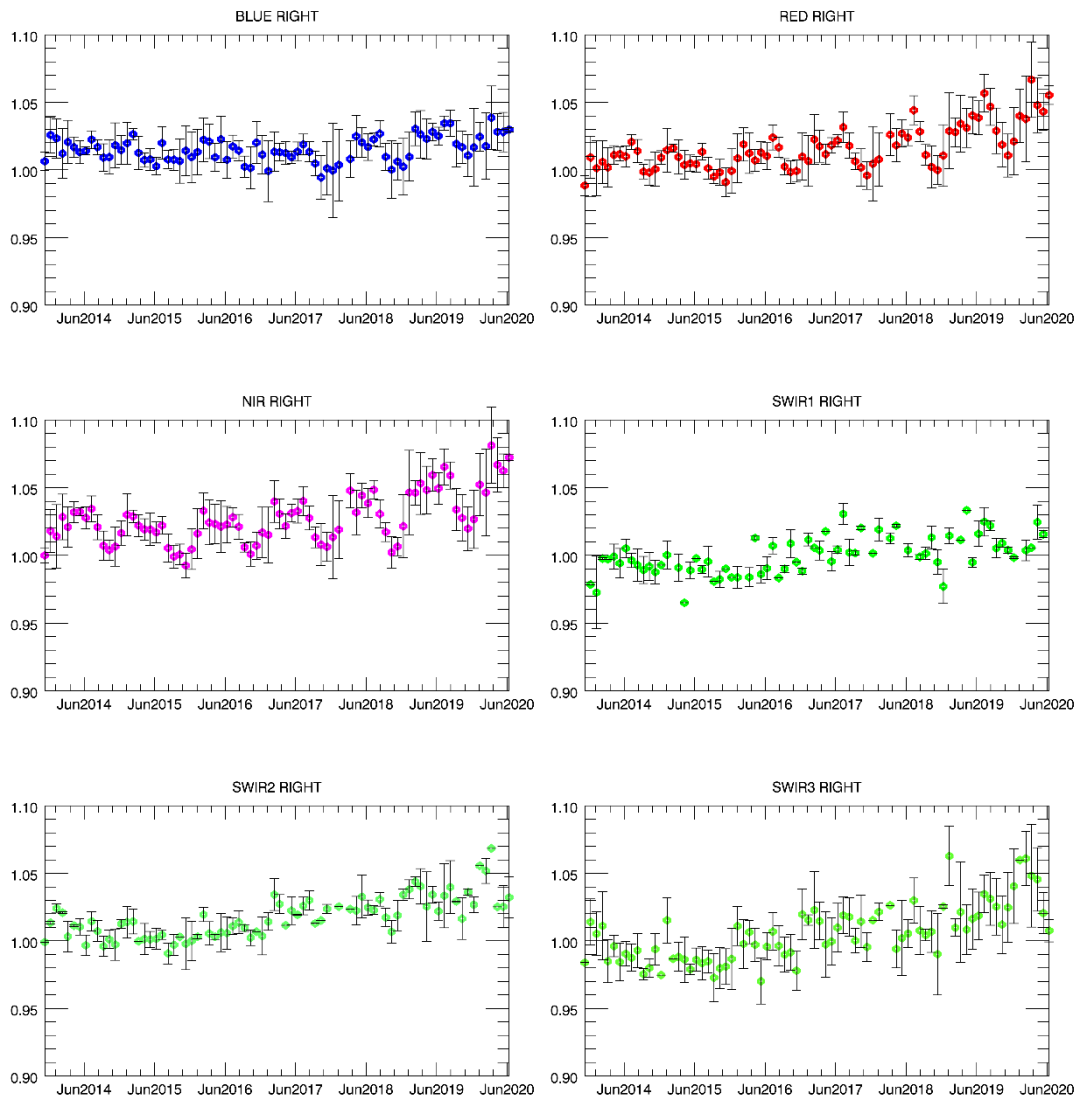


Figure 3. Libya-4 desert calibration results: RIGHT monthly averaged results (collection 1)

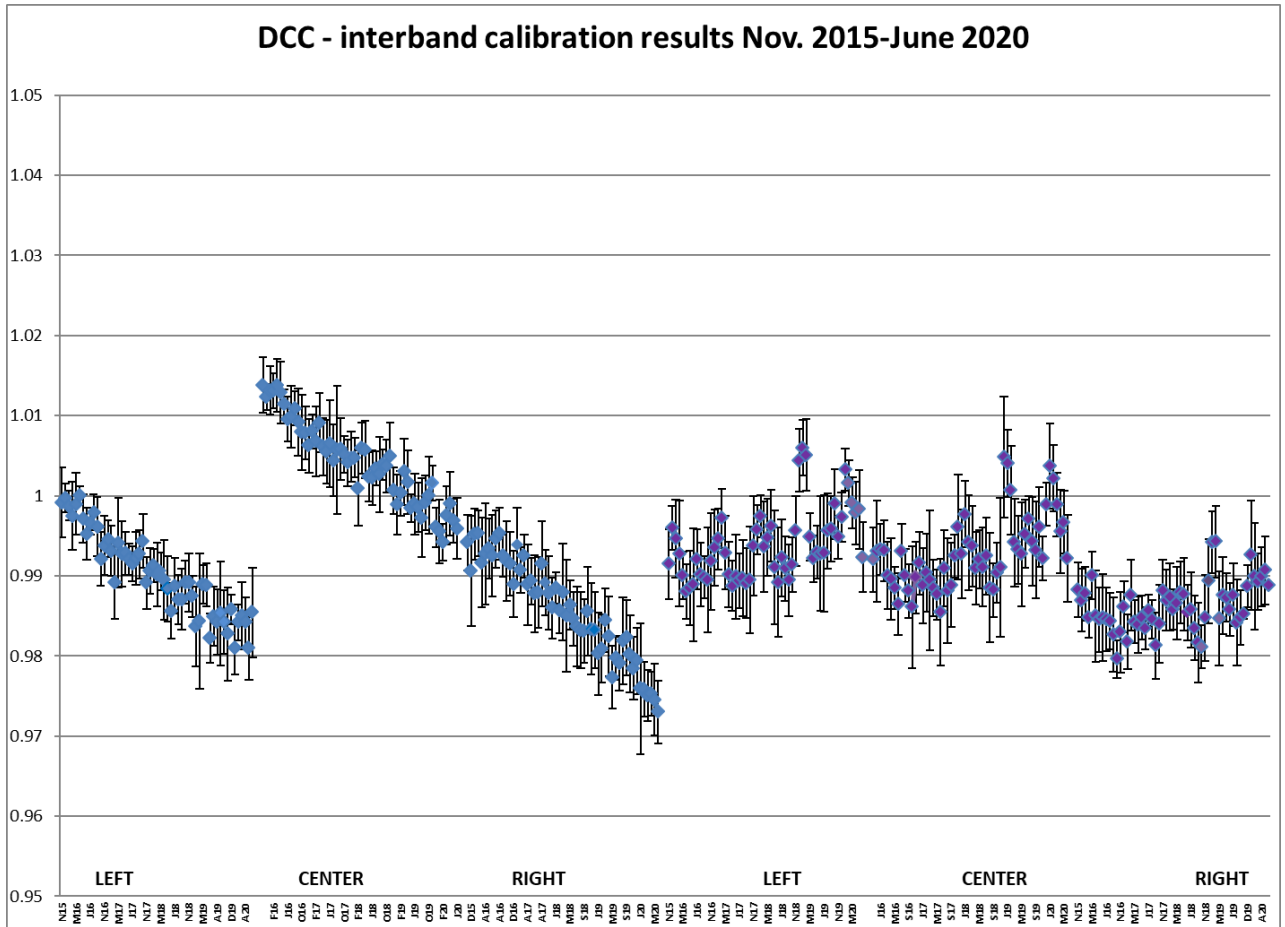


Figure 4. DCC inter-band calibration results: LEFT, CENTER and RIGHT camera (collection 1)

4.2. Geometric Calibration

Calibration image type	Total	Processed	Error
PROBA-V_L1C_INTERSECTION	14206	14206	0

Table13: Processed calibration images for this reporting period

During the reporting period, the average ALE was < 66 m ($\sigma < 92$ m). The day-to-day fluctuations were within the range 52 – 70 m, with no major ALE maxima. The average compliance was 99.33% (98.90% – 99.74% from BLUE – SWIR), with no major minima. The minimum values over the month were 98.65% - 99.63% (BLUE – SWIR).

Geometric ICP file

- PROBAV_ICP_GEOMETRIC#LEFT_20160907_V01
- PROBAV_ICP_GEOMETRIC#CENTER_20160907_V01
- PROBAV_ICP_GEOMETRIC#RIGHT_20160907_V01

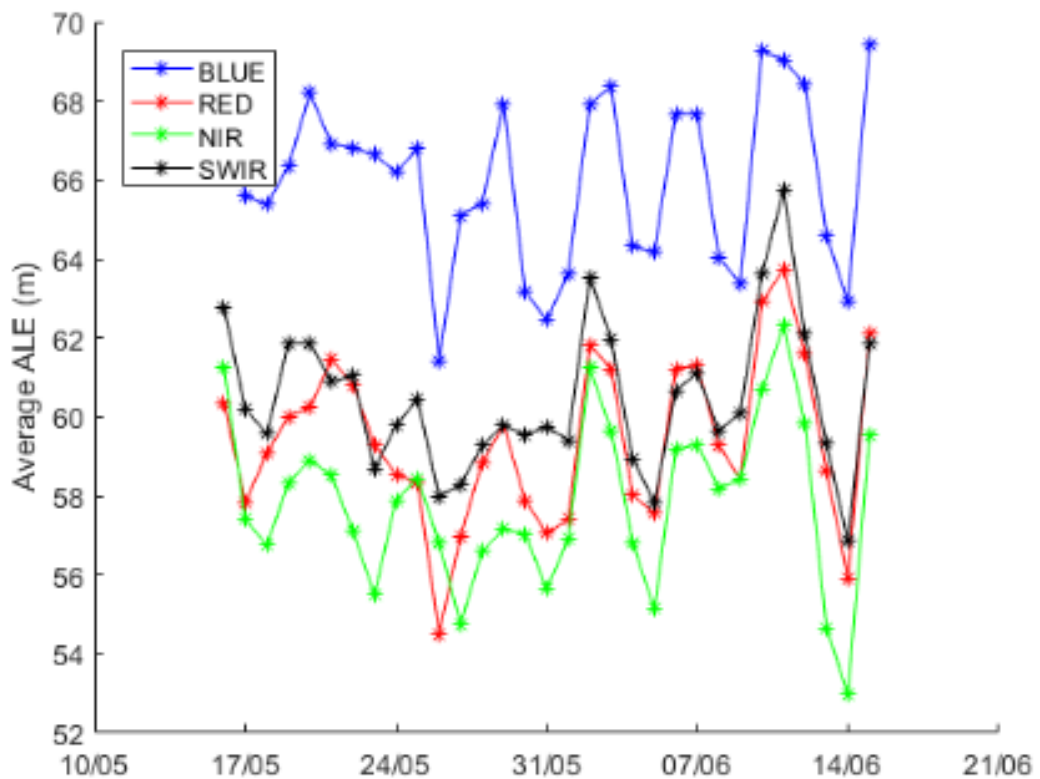


Figure 5: Daily ALE evolution for 16/5 – 15/6/2020.

5. Anomalies

5.1. System related issues

A detailed description of each issue is available in the issue tracking system <http://jira.vgt.vito.be>

Key	Summary	Status	Created	Component/s
PROBAVUS-7	Very small images fail to process	Resolved	10/01/2014	General
PROBAVUS-63	Cloud shadow detection at high solar zenith angles not working properly	Open	11/05/2016	Software
PROBAVUS-65	Processing statuses L2 products	In Progress	16/09/2016	Software
PROBAVUS-66	Cloud cover percentages on PDF products are not reliable	Resolved	19/10/2016	Software
PROBAVUS-68	ICP file version not taken into account when processing	In Progress	20/03/2017	Software
PROBAVUS-69	Version number of segment not filtered when querying for syntheses	Open	20/03/2017	Software
PROBAVUS-70	Investigate L2A artefact in data	Open	31/05/2017	Software
PROBAVUS-72	Status mask of data with decompression error is not correctly set	Open	22/06/2017	Software
PROBAVUS-75	Clear pixel edge in cloud shadow detection	Open	15/11/2017	Software

- 0 new issues were logged during this reporting period
- 0 issue(s) was resolved and closed during this reporting period
- 2 issues are resolved but remain to be closed formally
- 1 issues are resolved but remain in the list logging purposes
- 5 issue(s) is open and remain to be solved

5.2. Image processing issues

A detailed description of each issue is available in the Weekly Report and the image processing tracking system <https://juniper.vgt.vito.be/ciptools>

The below table gives an overview of the S1's of this reporting period:

	# S1	Dates
Major Gaps (> 21600 km² (missing TFF))	1	17/05
Large Gaps (< 21600 km²)	1	13/06
Medium Gaps (< 10000 km²)	2	14/06, 18/05
Minor Gaps (< 3600 km²)	5	30/05, 07/06, 05/06, 29/05, 08/06
Negligible Gaps (< 1000 km²)	20	09/06, 04/06, 25/05, 10/06, 15/06, 31/05, 26/05, 16/05, 06/06, 27/05, 11/06, 01/06, 22/05, 28/05, 02/06, 23/05, 12/06, 19/05, 24/05, 03/06
Complete synthesis (no gaps)	2	20/05, 21/05

Table14: Overview of S1 for this reporting period

Synthesis	Missing	Decom. Error	Geom. Error	Missing TFF	Autom. Recovery	VC4 Missing	Create Contours	Other
20200516	0.39%	3	3			1		
20200517	12.08%	3		1				
20200518	1.24%	1	4		2			
20200519	0.09%	6	2					
20200520	0.00%							
20200521	0.38%							
20200522	0.55%	2						
20200523	0.18%	1	4					
20200524	0.01%	2	2					
20200525	0.09%	4						
20200526	0.89%	2	3					
20200527	0.01%	2	1					
20200528	0.01%	2						
20200529	0.15%	5	3		1	1		
20200530	1.64%	2	4		1			
20200531	0.74%		4					
20200601	0.25%	1						
20200602	0.01%	1	3					
20200603	0.14%	2						
20200604	0.97%	4	6					
20200605	0.63%	2	3			1		
20200606	0.02%		3					
20200607	1.41%	4	4		1			
20200608	0.71%	1	10					
20200609	1.09%	1	17					
20200610	0.39%		7					
20200611	0.01%		6					
20200612	3.01%	6						
20200613	4.65%	4	9	1	1			
20200614	0.89%	7	4		1		2	
20200615	0.04%	5	5					

Table 15: List of synthesis with an error overview of the missing percentages and errors for this reporting period

6. Scheduled activities for the next period(s)

- Software upgrades:
No software upgrades planned
- Hardware:
No hardware upgrades planned
- Development:
Developments and testing on a new A/C module and cloud detection are ongoing for collection 2 reprocessing purposes.
- Other:
Preparations are ongoing to switch the PROBA-V ground segment to experimental mode and the communications thereof.

7. Operational remarks

No operational remarks